ROCKWELL AUTOMATION PROCUREMENT SPECIFICATION

**PROCUREMENT SPECIFICATION**

**Smart Machine**

**Integrated Smart Sensor**

**Systems**

**NOTICE:** The specification guidelines in this document are intended to aid in the specification of products. Specific installations have specific requirements, and Rockwell Automation does not recommend or intend any specific application based solely upon the guidelines provided here. Because of the variety of uses for this information, the user of, and those responsible for applying this information, are responsible for ensuring the acceptability of each application and appropriate use of the guidelines. In no event will Rockwell Automation be liable for misuse, misapplication or reliance on these guidelines in connection with any specific application. Rockwell Automation also disclaims indirect or consequential damages resulting from the use or application of this information.

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SMART MACHINE INTEGRATED SMART SENSOR SYSTEMS

1. GENERAL
   1. SUMMARY
      1. The IO-Link Integrated Smart Sensor system shall contain all components required to meet the performance, protection, and certification criteria of this specification.
   2. CERTIFICATIONS/REFERENCES
      1. Manufacturers shall be **certified to meet the IEC 62443-4-1 security standard and all products shall be developed in accordance with this standard. Certification shall be performed by an independent certification body (i.e. TUV Rheinland).**

**Example:**

<https://literature.rockwellautomation.com/idc/groups/literature/documents/ct/csm-ct001_-en-e.pdf>

* + 1. In-Cabinet (IP20) IO-Link Master shall meet the following certifications and approvals::
       1. c-UL-us
       2. CE
          1. EMC Directive 2104/30/EU, compliant with:

EN 61326-1

EN 61000-6-2

EN 61000-6-4

EN 61131-2

EN 50581

* + - 1. ODVA
      2. RCM AS/NZS CISPR11
      3. KCC Article 58-2
      4. EAC
    1. On-Machine (IP65/66/67/69K) IO-Link Master shall meet the following certifications and approvals:
       1. c-UR-us
       2. CE
          1. EMC Directive 2104/30/EU, compliant with:

EN 61326-1

EN 61000-6-2

EN 61000-6-4

EN 61131-2

* + - 1. ODVA
      2. RCM AS/NZS CISPR11
      3. KCC Article 58-2
  1. SUBMITTALS
     1. Drawings
        1. IO-Link Master Elevation Drawings shall include dimensional information
        2. IO-Link Master Unit Descriptions:
           1. Shall include amperage ratings
           2. IO-Link Communication rates
     2. Product Data Sheets
        1. IO-Link Master Data Sheets
        2. IO-Link Hub Data Sheets
        3. IO-Link Sensor Data Sheets
     3. Product Mechanical Drawings and Models
        1. IO-Link Masters shall have published AutoCAD 2D Drawings and 3D STEP Models
        2. IO-Link Hubs shall have published AutoCAD 2D Drawings and 3D STEP Models
        3. IO-Link Sensors shall have published AutoCAD 2D Drawings and 3D STEP Models
     4. Test procedures shall be per the manufacturer’s standards.
  2. CLOSEOUT SUBMITTALS (OPERATION AND INSTALLATION MANUALS)
     1. Product Data Sheets
        1. IO-Link Master Data Sheets
        2. IO-Link Hub Data Sheets
        3. IO-Link Sensor Data Sheets
     2. Test procedures shall be per the manufacturer’s standards.
     3. Operation and Installation Data
        1. IO-Link Master Data Installation Instructions
        2. IO-Link Hub Installation Instructions
        3. IO-Link Sensor Installation Instructions
  3. QUALITY ASSURANCE
     1. Qualifications:
        1. Suppliers:
           1. All inspection and testing procedures shall be developed and controlled under the guidelines of the supplier’s quality system and must be registered to ISO 9001 and regularly reviewed and audited by a third party registrar.
  4. DELIVERY, STORAGE AND HANDLING
     1. Supplier shall store the equipment in a clean and dry space at an ambient temperature range of -40°C to 85°C (-40°F to 185°F).
     2. The supplier shall protect the units from dirt, water, construction debris and traffic.
  5. WARRANTY
     1. The manufacturer shall provide their standard parts warranty for eighteen (18) months from the date of shipment or twelve (12) months from the date of being energized, whichever occurs first.
     2. This warranty applies to IO-Link integrated Smart Sensor Systems .

1. PRODUCTS
   1. MANUFACTURERS
      1. Allen-Bradley – 1732E or 1734 IO-Link Master Module (No substitutions)
   2. RATINGS
      1. In-Cabinet (IP20) IO-Link Master shall meet the following ratings:
         1. Isolation Voltage: 50V (continuous)
         2. Field power bus supply 19.2Vdc min.
         3. Field power bus supply 28.8Vdc max
         4. Input ratings: 24Vdc, 12mA
         5. Output ratings; per channel: 24Vdc, 0.15A
         6. Output ratings, per module, max: 24Vdc, 0.6A
      2. On-Machine (IP65/66/67/69K) IO-Link Master shall meet the following ratings:
         1. Isolation Voltage: 50V (continuous)
         2. Voltage, power, max: 28.8Vdc.
         3. Voltage, power, min: 20Vdc
         4. Input ratings: 24Vdc, 12mA
         5. Sensor source voltage available current, per channel, max: 500mA
         6. Sensor source voltage available current, per connector, max: 1A.
         7. Current, Auxiliary Power (module plus Digital Output loads, plus Sensor Voltage loads, plus power daisy-chain loads) max per module: 4A
         8. Digital Output on-state current, per output, max: 250mA
      3. The IO-Link Communication rate shall be:
         1. 4.8kB
         2. 38.4kB
         3. 230.4kB.
      4. In-Cabinet (IP20) IO-Link Master shall be designed to operate in the following environmental conditions:
         1. Ambient temperature range:
            1. -20°C to 55°C (-4°F to 131°F). Operating
            2. -40°C to 85°C (-40°F to 185°F) Non-operating
         2. Relative humidity range: 0% to 95% non-condensing.
         3. Shock and vibration:
            1. Shock: 30g operating and 50g non-operating
            2. Vibration: .5g @ 10...500 Hz
      5. On-Machine (IP65/66/67/69K) IO-Link Master shall be designed to operate in the following environmental conditions:
         1. Ambient temperature range:
            1. -20°C to 60°C (-4°F to 140°F). Operating
            2. -40°C to 85°C (-40°F to 185°F) Non-operating
         2. Relative humidity range: 0% to 95% non-condensing.
         3. Shock and vibration:
            1. Shock: 30g operating and 50g non-operating
            2. Vibration: .5g @ 10...500 Hz
   3. CONFIGURATION/PROGRAMMING
      1. The IO-Link Integrated Smart Sensing Solution shall be configurable using:
         1. Studio 5000™ Logix Designer – This software, a single development environment for the entire control system, includes add-on profiles which minimize the need to individually program the required parameters and tags:
            1. Auto generation of descriptive tag names and respective tag data types.
            2. Application specific names for process data
            3. Single development environment – minimizes errors associated with multiple software tools.
            4. Configuring entire system from one environment – minimizes I/O mismatch errors.
            5. Auto browse capabilities to automatically discover devices connected to the masters to streamline device system integration
            6. Connectivity to FactoryTalk Analytics for Devices (Shelby) via device profiles
            7. IODD files available within the software or can be uploaded from IO-link devices where available
      2. Through the Studio 5000 Logix Designer, a Logix controller shall be able to use Automatic Device Configuration (ADC) to detect a replaced sensor and download the needed firmware and all configuration parameters.
      3. With Studio 5000 software, the following data shall be stored in the project file and in the control system’s Programmable Automation Controller. This will allow configuration to be stored in the ACD file for Studio 5000 Logix Designer and will easily be recoverable in case of an IO-Link master and/or device failure.
         1. Sensor configuration settings
         2. Multiple configuration settings
         3. Communication Health
         4. Trending
         5. Low margin alarm
         6. Sensor Output Status
         7. 1732E-8IOLM12R Master Change of State Timestamp
         8. 1732E-8IOLM12R Master Change of Event
         9. Device Locking (on photoelectric, ultrasonic, condition sensors)
         10. Proximity alarm where applicable
         11. Locator indicator where applicable
         12. Proximity sensor head damage (proximity sensors)
         13. FactoryTalk Analytics for Devices Profiles (Shelby)
             1. Sensor status, health, temperature, margin level
             2. At least 8 data words of inputs and 8 data words of outputs that can be dynamically configured to access any parameter.
         14. 1732E-8IOLM12R IO-Link Master shall be able to be flash-updated with ControlFlash
         15. Faceplates shall be provided for PanelView 5000 and/or PanelView Plus for masters and sensors where applicable
   4. COMMUNICATIONS
      1. The On-Machine IP65/66/67/69K IO-Link Master shall be capable of communications through standard protocols, and EtherNet/IP shall be the preferred network.
         1. Through its Ethernet port, the IO-Link Master shall be capable of direct connection to a Programmable Automation Controller.
         2. Through its integral Ethernet port, the EtherNet/IP network is supported.
         3. The IO-Link Master Dual port EtherNet/IP will support Device Level Ring topology
         4. 1732E-8IOLM12R shall utilize IEEE 1588 time synchronization (CIP Sync)
   5. CONTROL I/O
      1. The IO-Link Master shall be capable of reading actual sensor levels
      2. The IO-Link Master shall read condition levels in actual engineering units (mm, bar, Celsius)
      3. The IO-Link Master shall be capable of setting multiple sensing windows
      4. The On-Machine IP65/66/67/69K IO-Link Master shall time stamp and stores all sensor and master level events for up to 40 events in each IO-Link channel (FIFO)
      5. The On-Machine IP65/66/67/69K IO-Link Master shall send input time stamp to the Programmable Automation Controller upon change of state
      6. The In-Cabinet (IP20) IO-Link Master shall be able to add types of modules (standard, safety, analog) on the same adapter.
   6. DIMENSIONS
      1. The In-Cabinet (IP20) IO-Link Master shall not be larger than 56 x 12 x 75.5 mm (H x W x D)
      2. The On-Machine IP65/66/67/69K IO-Link Master shall not be larger than 179 x 37 x 43.3 mm (H x W x D)
         1. The On-Machine IP65/66/67/69K IO-Link Master shall use only M12 connectors for power, I/O and network
2. EXECUTION
   * 1. .
   1. INSTALLATION
      1. Installation shall be in compliance with all manufacturer requirements, instructions and drawings.

END OF SECTION